SAFCA Sacramento Area Flood Control Agency

Ecosystem Restoration

U.S. Army Corps of Engineers

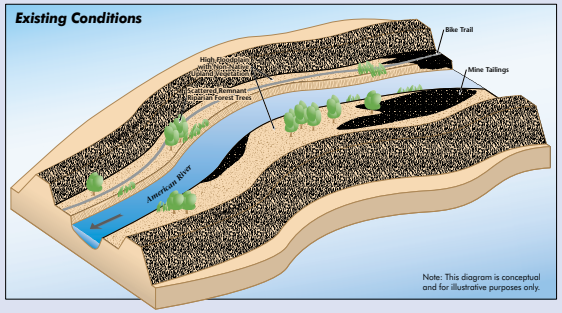
Mission and Vision of Ecosystem Restoration: An Overview

Ecosystem restoration is one of the primary missions of the U.S. Army Corps of Engineers' (Corps') Civil Works program.

The purpose of ecosystem restoration is to restore significant ecosystem function, structure, and dynamic processes that have been degraded. The intent of restoration is to reestablish the attributes of a naturalistic, functioning, and self-regulating system.

The Corps' mission of protecting, restoring, conserving, and managing ecological resources has taken on greater importance over recent decades. The lower American River study is an example of evaluating habitat restoration opportunities as part of a broader regional water resources management program authorized by Congress.

The stated purpose of ecosystem restoration efforts is to comprehensively examine the problems that contribute to system degradation and to develop alternative means of solving these problems.



Key Problems and Opportunities in the Lower American River Ecosystem

The combination of a century-and-a-half of mining, development, floodplain constriction, dam construction, and flow modifications have altered the physical processes that sustain ecosystem values, thereby contributing to significant degradation of the lower American River ecosystem. Some of the problems and opportunities within this ecosystem include:

Problem: *High floodplains* produced by deposition of sandy sediments from upstream hydraulic mining during the Gold Rush are disconnected from the ordinary flow of the river, except in very high flow events. Without a regular cycle of frequent inundation bringing water to the unnaturally high terraces and shallower water tables, native plant species cannot regenerate adequately.

Opportunity: Removing excess soil to reestablish more frequent inundation and a shallower water table facilitates a more natural hydrologic cycle for native plant establishment and makes a larger area subject to frequent inundation. This work results in healthy, diverse riparian communities and overall habitat improvement.

Problem: *Channel downcutting* between the high floodplain banks results in a lack of shallow aquatic habitat along channel edges, which is important to juvenile fish rearing. This also results in a lack of shallow, slow-water sidechannels and other off-channel aquatic habitats that are important to both fish rearing and fish spawning.

Opportunity: High quality fish rearing habitat can be created by cutting benches to lower bank elevations, or by constructing shallowly submerged fill benches along the channel edges, together with placing instream woody material and planting riparian vegetation near the shoreline.

Problem: The dry upland conditions of the high floodplains and the modified hydrologic cycle allow *invasive non-native plants* to outcompete the native species, because non-native plants are better adapted to these dry conditions. The system generally lacks vegetative cover and diversity.

Opportunity: Creating more frequent inundation, combined with removing invasive non-native species and planting native riparian plants, enhances ecological function.

Problem: *Dredger tailings* in the form of bars and deposits along the riverbanks and on the floodplain provide a poor substrate for riparian plants and less-than-optimal fish and wildlife habitat values. Upstream dams have eliminated transport of sediment downstream and slowed the development of substrate for plant colonization.

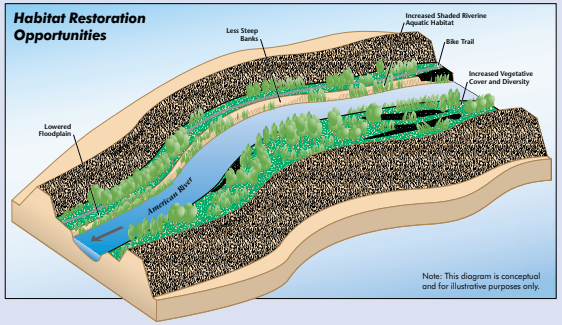
Opportunity: Removing and redistributing large river cobble, combined with reintroducing fine-grained bank material, may foster conditions more suitable for regeneration of native riparian vegetation.

Problem: Deep pools occur in several locations where the river captured abandoned gravel mining pits. These pools provide *habitat for predator fish* that prey on juvenile salmon.

Opportunity: Filling excessively deep pools, lowering the floodplain, developing sidechannels, and disposing of dredger tailings could eliminate predator habitat and increase juvenile salmon survival.

Restoration Objectives for the Lower American River Ecosystem

1. Enhance values of plant, wildlife, and aquatic habitat.
2. Increase shaded riparian aquatic cover.
3. Increase the diversity of floodplain habitat.
4. Improve connectivity between the low-flow channel and river floodplains.
5. Enhance habitat for Sacramento splittail and anadromous fish.
6. Facilitate establishment of native plant species.
7. Enhance recreation and educational opportunities by developing high-quality riparian and aquatic habitats.
8. Ensure compatability with flood control system and proposed improvements.



Developing an Ecosystem Restoration Plan

This study will follow these steps:

- Identify sites in the lower American River that present promising restoration opportunities.
- Design measures appropriate to the sites that satisfy restoration objectives.
- Analyze and compare measures in terms of cost and effectiveness.
- Select a subset of the best measures to form a best alternative plan.

The American River Long Term Study will incorporate this ecosystem restoration plan with a flood control plan.

Display #5, 9/29/00

Exhibit 6
Ecosystem Restoration